APPENDIX B

SHIPYARD BUILD STRATEGY

APPENDIX B

WASHINGTON STATE FERRIES

NEW 144 – AUTO FERRIES
DESIGN - BUILD CONTRACT

SHIPYARD BUILD STRATEGY

Shipyards must provide a single build strategy that presents the shipyard's approach to construction of the vessels and which contains all of the information the shipyard considers necessary in order to enable WSF to understand and evaluate the shipyard's plan for building the vessels. Subsequent to evaluation of the submitted build strategy, WSF may request clarification and/or additional information, which shall be provided.

The build strategy should discuss all aspects of the construction process to present a coherent description of the shipyard's approach to meet the Contract requirements. Therefore, the build strategy must describe the method of construction from design work through keel laying to completion of outfitting, launching, testing, drydocking, delivery and warranty issuance, and provide a description of the assets and procedures the shipyard will use.

The build strategy must also demonstrate and verify that the ferries will be constructed in the state of Washington in accordance with the requirements of the project-enabling legislation (RCW 47.60.812 through 47.60.822).

The following information is to be included, as a minimum, in the submission of the build strategy:

1. Approach to Construction

a. Present in narrative form the overall plan for vessel construction describing concepts, methods, sequence of the various evolutions involved and any unique features of the shipyard's approach to construction.

b. Provide a description of the plan to integrate any portion or section of the vessel constructed in a separate geographical location from others. Include a transportation plan, a risk assessment and a mitigation procedure for this process.

c. Provide a major milestone Master Construction Schedule (MCS) which shows significant key events, and major controlling activities, including, but not limited to, the following for each vessel (sequence may be changed and milestones added or modified to conform to shipyard's build strategy):

- Completion of approved detailed working drawings (first vessel only);
- Start of construction (cutting steel);
- Keel laying;
- Start block outfitting;
- Hull completion;
- Complete installation of main propulsion equipment;
- Superstructure complete;
- Launching;
- Testing;
- Propulsion system light off;
- Drydocking;
- Dock trials;
- Sea trials;
- Delivery of the vessel to WSF; and
- Delivery of as-built drawings and other technical documentation (technical manuals, parts lists, warranty period, etc.).

A plan for correlating these milestones with the production plan must be described. Shipyards must present a realistically achievable MCS which considers controlling activities, key events, their order and interdependency, and the mutual exclusiveness of certain activities.

d. Describe unique design or construction arrangements to be employed in the New 144-Auto Ferries project not covered in any other data.

Shipyards must convince WSF that this project has been well thought out, will be well organized and managed in an effective manner with proper concern for the safety of all concerned and due respect for the environment.

In addition, shipyards must demonstrate to WSF that: (i) a thorough effort has been made to identify potential problems associated with the build strategy, the method of vessel construction and management of the project; and (ii) specific, describable solutions have been found which are presented in the build strategy.

2. Technical Plan

Shipyards must exhibit a capability to perform and meet the requirement of the Technical Specification for both the Contract level design necessary to prepare and gain approval for Phase II Technical Proposals and the Detailed Design required in Phase III involved with the construction of United States registry passenger vessels.

a. The Contract work under the Design-Build Contract in Phase III will require the shipyard to develop detailed drawings as described in the Contract documents. Provide a detailed narrative explaining how this will be accomplished.

b. In the event the Detailed Design is to be done by a combination of organizations such as more than one design element of the shipyard's staff and/or subcontractors, provide the following:

   i. Design organizations involved (shipyard and subcontractors). Describe what portion will be performed by the design agent and the interface between the shipyard's technical managers and the design agent. Include an organization chart showing this interface. Provide a discussion of how the shipyard will ensure quality and adherence to Technical Proposal requirements by the design agent.

   ii. Central design coordination to ensure proper interfaces of systems between modules to preclude interferences.

   iii. Specific task allocation by organization.

   iv. Integrated design schedule for modules.

   v. Method of achieving drawing standardization to preclude confusion in production execution of the drawings.

   vi. Standards agreed upon between all design agents for materials and procedures.

c. If a modular construction method is to be used, explain the design process used for identification of module boundaries. Describe in detail how major systems such as ventilation ducting, fire main, steam, gray water and sewage piping will be designed across module boundaries. Address the iterative process for assuring major systems are logically designed in individual modules and potential interferences are avoided.

d. Provide a detailed narrative describing the process for integrating modules. Include a plan for technical analysis of structures affected and procedures utilized for assembling each module to, or loading each module on, the progressing structure.

3. <u>Production Plan</u>

a. Shipyards must provide a written narrative which describes the production methodology and sequence. Include location(s) of where the production work is to take place.

b. Describe the sequence of construction and erection of decks, bulkheads and other major hull components. In addition, provide sequence of installation of major machinery such as main engines, reduction gears, shafts, propellers, consoles, switchboards, fire pumps, air compressors, HVAC equipment, etc.

c. Describe the outfitting plan and process. If it is intended to construct the vessels using modular construction, zone outfitting, group technology or a combination of any of these, provide the following:

i. Identify the modules and facilities for construction and outfitting.

ii. Discuss capabilities of respective facilities to construct and outfit modules.

iii. Pre-outfitting to be accomplished by module (systems, trades, percentage).

iv. Organization(s) to accomplish outfitting of modules or portions of the vessels.

v. Subcontractors to be used by system or discipline.

vi. Method to achieve standardization of material and installation between modules if different shipyard organizations or subcontractors are used on the different modules or portions of the vessels.

vii. Describe in detail integration of the modules including the following:

- Location and capability of the integration facility;
- Method and capability for moving modules to integration area;
- Sequence and method of integration; and
- Responsibility by module for integration.

viii. Discuss how final outfitting, including final paint out, deck coverings, furniture installation, etc., will be done so as to achieve uniformity in appearance and in quality.

ix. Provide a schedule for completion of construction of modules, pre-outfitting completion (for specified degree of pre-outfitting), testing of module components, integration of modules and system testing after integration.

x. Provide a brief description of the shipyard's system for production scheduling and tracking work progress for both the design and the construction of the vessels.

d. Describe the test organization, and in narrative form, discuss the shipyard's plan for all testing (component and system) and trials. Include identification of responsibility for all test coordination and reporting.

e. Identify which portions of ship construction and outfitting will be performed by subcontractors.

f. Discuss the program to assure uniformity of work performed by subcontractors within the individual vessel and among the class of vessels.

g. If the subject vessel, or any portion of the vessel is required to be towed, or if any portion of the vessel is to be transported on a towed vehicle during execution of the Contract, describe in detail the procedure, equipment and subcontractor (if any) to be used. Include plan for survey of the vessel or portion thereof to be towed, fire fighting and damage control plan during tow, risk assessment and heavy weather contingency plan.

4. Material Procurement Plan

a. Shipyards must provide a material procurement plan and program that assures standardization of equipment and materials, both within the individual vessel and among the class of vessels.

b. If material procurement is to be accomplished by more than one organization or by more than one element in an organization, describe in detail how standardization of materials will be accomplished within this structure.

c. Provide material ordering schedule and expected dates of arrival of major equipment as compared to need dates shown in the construction schedule.

d. Identify long lead-time material, impact on schedule and work around plans if required.

5. Ability to Meet Vessel Delivery Dates

a. Shipyards must affirm that the shipyard has sufficient management, technical, production, material, financial and quality control capabilities on hand or available to meet the specified Delivery Dates for each vessel (see RFP Volume III, Exhibit 4) and to accommodate all other Contract work.

b. Provide any additional information the shipyard believes will assist WSF in evaluation of its ability to meet the vessel Delivery Dates.

(END)